CLAIMS

1. A fluid passing flat hollow body comprising an upper and a lower flat plate elongated laterally, a peripheral wall interconnecting peripheral edges of the upper and lower walls, and a partition wall dividing the interior of the wall into front and rear two channels extending laterally, each of the upper and lower walls having two holes formed in a right end portion thereof respectively on front and rear opposite sides of the partition wall and spaced apart transversely of the upper or lower wall for causing the respective channels to communicate with the outside therethrough, a left end portion of the partition wall being cut out to hold the two channels in communication with each other.

2. A fluid passing flat hollow body according to claim 1 which comprises an upper and a lower flat plate elongated laterally and spaced apart as positioned one above the other, and a channel forming body interposed between and brazed to the two flat plates, the channel forming body comprising two straight side bars extending laterally and arranged between the upper and lower flat plates respectively at front and rear opposite side edges thereof, an intermediate bar extending laterally and disposed between and spaced apart from the two side bars, two heat transfer area increasing portions each interconnecting the intermediate bar and each of the side bars integrally therewith and positioned at an intermediate portion of the height of the bars, and end bars extending forwardly or rearwardly inward from right ends of the respective side bars integrally therewith and having respective inner ends

butting on and brazed to front and rear opposite side faces of a right end of the intermediate bar, the intermediate bar having a left end portion cut out therefrom, the two heat transfer area increasing portions having respective right end portions cut out therefrom, each of the upper and lower flat plates having holes formed in a right end portion thereof respectively on front and rear opposite sides of the intermediate bar, the upper and lower flat plates providing the respective upper and lower walls, a left end portion of each of the upper and lower two flat plates being bent toward the other flat plate, with the bent portions lapped over and brazed to each other, to thereby provide a left wall portion of the peripheral wall, the side bars of the channel forming body providing respective front and rear opposite side wall portions of the peripheral wall, the end bars of the channel forming body providing a right wall portion of the peripheral wall.

3. A fluid passing flat hollow body according to claim 2 wherein each of the upper and lower flat plates is made of an aluminum brazing sheet, and the channel forming body is made of an aluminum extrudate.

4. A fluid passing flat hollow body according to claim 2 wherein one of the left-end bent portions of the upper and lower flat plates which is positioned inside has a part corresponding to each of side bars of the channel forming body, the side bar corresponding part having on an inner side thereof a radius of curvature permitting no clearance to be created between the side bar corresponding part and the side bar, the

other bent portion which is positioned outside having a part corresponding to each side bar of the channel forming body, the second-mentioned side bar corresponding part having on an inner side thereof a radius of curvature permitting no clearance to be created between the side bar corresponding parts of the inside and outside bent portions, and the part of each of the left-end bent portions of the upper and lower flat plates other than the parts thereof corresponding to the side bars of the channel forming body has on an inner side thereof a radius of curvature greater than the radius of curvature of the side bar corresponding parts on the inner side thereof.

5. A fluid passing flat hollow body according to claim 4 wherein the side bar corresponding parts of the left-end bent portions of the upper and lower flat plates are up to 0.2 mm in radius of curvature on the inner side thereof, and the parts of the left-end bent portions of the upper and lower flat plates other than the side bar corresponding parts thereof have on the inner side thereof a radius of curvature not smaller than the thickness of the upper and lower flat plates.

6. A fluid passing flat hollow body according to claim 4 wherein the left-end bent portion of the upper or lower flat plate which bent portion is positioned inside has at the part thereof other than the side bar corresponding parts such a height that said part of the bent portion will not interfere with the curved part of the bent portion which is positioned outside.

7. A heat exchanger comprising fluid passing portions extending laterally and arranged one above another in parallel

at a spacing, a spacer disposed between right ends of each pair of adjacent fluid passing portions and brazed to the pair of fluid passing portions, a spacer bar disposed between left ends of each pair of adjacent fluid passing portions and brazed to the pair of fluid passing portions, and a fin provided between and brazed to each pair of adjacent fluid passing portions and positioned between the spacer and the spacer bar, each of the fluid passing portions comprising a fluid passing flat hollow body according to claim 1, the spacer having two through holes communicating respectively with the two holes of each of the upper and lower walls of the flat hollow body.

8. A heat exchanger comprising fluid passing portions extending laterally and arranged one above another in parallel at a spacing, a spacer disposed between right ends of each pair of adjacent fluid passing portions and brazed to the pair of fluid passing portions, a spacer bar disposed between left ends of each pair of adjacent fluid passing portions and brazed to the pair of fluid passing portions, and a fin provided between and brazed to each pair of adjacent fluid passing portions and positioned between the spacer and the spacer bar, each of the fluid passing portions comprising a fluid passing flat hollow body according to any one of claims 2 to 6, the spacer having two through holes communicating respectively with the two holes of each of the upper and lower walls of the flat hollow body.

9. An industrial machine comprising a heat exchanger according to claim 7 and useful as an oil cooler.

10. An industrial machine comprising a heat exchanger

according to claim 7 and useful as an aftercooler.

11. An industrial machine comprising a heat exchanger according to claim 8 and useful as an oil cooler.

12. An industrial machine comprising a heat exchanger according to claim 8 and useful as an aftercooler.

13. A process for fabricating a heat exchanger according to claim 8 which process is characterized by:

preparing channel forming body blanks of aluminum extrudates each comprising two straight side bars extending laterally and spaced apart forwardly or rearwardly, an intermediate bar extending laterally and disposed between and spaced apart from the two side bars, and two flat plate portions each interconnecting the intermediate bar and each of the side bars integrally therewith and positioned at an intermediate portion of the height of the bars, pairs of upper and lower flat plates elongated laterally, spacers each having two through holes spaced apart forwardly or rearwardly, and spacer bars,

making channel forming bodies each by cutting out left and right end portions of the intermediate bar of the blank, cutting out a right end portion of each of the flat plate portions of the blank over a length equal to the length of the cutout of the right end portion of the intermediate bar, subjecting each flat plate portion of the blank to press work to form a heat transfer area increasing portion, and bending right end portions of the side bars of the blank forwardly or rearwardly inward to cause outer ends thereof to butt on front and rear opposite side faces of the right end of the intermediate bar

and to form end bars,

bending the flat plates in each pair toward each other at left end portions thereof to form bent portions and forming two holes in a right end portion of each flat plate respectively on front and rear opposite sides of the intermediate bar,

arranging a plurality of combinations one above another in parallel at a spacing, each of the combinations comprising the channel forming body interposed between the pair of upper and lower flat plates, providing the spacer between right end portions of each pair of adjacent combinations with the two through holes in communication with the respective two holes of each of the flat plates, providing the spacer bar between left end portions of each pair of adjacent combinations, and further providing a fin between each pair of adjacent combinations, as positioned between the spacer and the spacer bar, and

brazing each pair of upper and lower flat plates to the side bars, the intermediate bar and the end bars of the channel forming body between the pair of flat plates, outer ends of the end bars to the intermediate bar, and the bent portions of the pair of flat plates to each other, and further brazing each pair of adjacent flat plates to the spacer, the spacer bar and the fin which are interposed therebetween.

14. A process for fabricating a heat exchanger according to claim 13 wherein the flat plates are made of an aluminum brazing sheet, the spacers, the spacer bars and channel forming body blanks are made of aluminum extrudates, the fin is made of a thin aluminum plate, and the brazing operation is

conducted with a brazing material melting from the flat plates.

15. A process for fabricating a heat exchanger according to claim 13 wherein one of the left-end bent portions of the upper and lower flat plates which is positioned inside has a part corresponding to each of side bars of the channel forming body, the side bar corresponding part having on an inner side thereof a radius of curvature permitting no clearance to be created between the side bar corresponding part and the side bar, the other bent portion which is positioned outside having a part corresponding to each side bar of the channel forming body, the second-mentioned side bar corresponding part having on an inner side thereof a radius of curvature permitting no clearance to be created between the second-mentioned side bar corresponding part and the side bar, and the part of each of the left-end bent portions of the upper and lower flat plates other than the parts thereof corresponding to the side bars of the channel forming body has on an inner side thereof a radius of curvature greater than the radius of curvature of the side bar corresponding parts on the inner side thereof.

16. A process for fabricating a heat exchanger according to claim 15 wherein the side bar corresponding parts of the left-end bent portions of the upper and lower flat plates are up to 0.2 mm in radius of curvature on the inner side thereof, and the parts of the left-end bent portions of the upper and lower flat plates other than the side bar corresponding parts thereof have on the inner side thereof a radius of curvature not smaller than the thickness of the upper and lower flat plates.

17. A process for fabricating a heat exchanger according to claim 15 wherein the left-end bent portion of the upper or lower flat plate which bent portion is positioned inside has at the part thereof other than the side bar corresponding parts such a height that said part of the bent portion will not interfere with the curved part of the bent portion which is positioned outside.